

Claims:

1. A method for controlling transmission power of a downlink signal from a base station to a mobile station depending on a base station selection signal, wherein the mobile station selects at least one primary base station among a plurality of base stations which are connected to the mobile station for soft handover to produce the base station selection signal designating said at least one primary base station, comprising the steps of:
 - at each of the base stations,
 - 10 receiving the base station selection signal from the mobile station;
 - measuring an amount of loss of the base station selection signal;
 - determining whether the amount of loss of the base station selection signal exceeds a threshold;
 - when the amount of loss of the base station selection signal does not exceed the threshold, setting the transmission power of the downlink signal to a selected one of a normally controlled level and a minimum level depending on the base station selection signal; and
 - 20 when the amount of loss of the base station

selection signal exceeds the threshold, setting the transmission power of the downlink signal to the normally controlled level.

2. The method according to claim 1, wherein the
5 amount of loss of the base station selection signal is a number of erroneously received bits in the base station selection signal.

3. The method according to claim 1, wherein the
amount of loss of the base station selection signal is a
10 ratio of a punctured length to a length of the base station selection signal.

4. The method according to claim 1, wherein the threshold varies depending on a length of the base station selection signal.

15 5. The method according to claim 3, wherein the threshold varies depending on the length of the base station selection signal.

6. A method for controlling transmission power of a downlink signal which is transmitted in frames from a

base station to a mobile station depending on a base station selection signal, wherein the mobile station selects at least one primary base station among a plurality of base stations which are connected to the mobile station for soft
5 handover to produce the base station selection signal designating said at least one primary base station, wherein an uplink signal including the base station selection signal is transmitted in frames to the base stations, the method comprising the steps of:

10 at each of the base stations,

a) receiving the uplink signal including the base station selection signal from the mobile station;

15 b) determining a transmission power update timing so that the downlink signal received at the mobile station changes in transmission power at a predetermined timing synchronized with that of other base stations; and

20 c) when reaching the transmission power update timing, setting the transmission power of the downlink signal to a selected one of a normally controlled level and a minimum level depending on the base station selection signal.

7. The method according to claim 6, wherein each frame of the uplink signal and the downlink signal is

composed of a plurality of time slots which are numbered consecutively, wherein the transmission power update timing in each of the base stations is represented by a number of same time slot.

5 8. The method according to claim 7, wherein the time slot number indicating the transmission power update timing is determined by delaying a receiving time of the base station selection signal by an amount of time determined so that the downlink signal received at the
10 mobile station changes in transmission power at same timing.

9. The method according to claim 7, wherein the time slot number indicating the transmission power update timing is determined by

15 $(j + \text{Tos}) \bmod F_n$,

where j is number of a time slot indicating a last portion of the base station selection signal, Tos is waiting time for transmission power update, F_n is number of slots included in one frame, and \bmod is an operator whose result
20 is the remainder of a division operation.

10. The method according to claim 9, wherein the

waiting time T_{os} varies depending on a propagation delay between the base station and the mobile station.

11. The method according to claim 9, wherein the waiting time T_{os} varies depending on the time slot number
5 j .

12. A device for controlling transmission power of a downlink signal depending on a base station selection signal in each of base stations of a mobile communications system, wherein a mobile station selects at least one primary base station among a plurality of base stations which are connected to the mobile station for soft handover to produce the base station selection signal designating said at least one primary base station, comprising:

a receiver for receiving the base station
15 selection signal from the mobile station; and

a controller for controlling the transmission power of the downlink signal to the mobile station by measuring an amount of loss of the base station selection signal;

20 determining whether the amount of loss of the base station selection signal exceeds a threshold;

when the amount of loss of the base station selection

signal does not exceed the threshold, setting the transmission power of the downlink signal to a selected one of a normally controlled level and a minimum level depending on the base station selection signal; and

5 when the amount of loss of the base station selection signal exceeds the threshold, setting the transmission power of the downlink signal to the normally controlled level.

13. The device according to claim 12, wherein the
10 amount of loss of the base station selection signal is a number of erroneously received bits in the base station selection signal.

14. The device according to claim 12, wherein the amount of loss of the base station selection signal is a
15 ratio of a punctured length to a length of the base station selection signal.

15. The device according to claim 12, wherein the threshold varies depending on a length of the base station selection signal.

20 16. The device according to claim 14, wherein the

threshold varies depending on the length of the base station selection signal.

17. A device for controlling transmission power of a downlink signal which is transmitted in frames from a 5 base station to a mobile station depending on a base station selection signal, wherein the mobile station selects at least one primary base station among a plurality of base stations which are connected to the mobile station for soft handover to produce the base station selection signal 10 designating said at least one primary base station, wherein an uplink signal including the base station selection signal is transmitted in frames to the base stations, the device comprising:

a receiver for receiving the uplink signal 15 including the base station selection signal from the mobile station; and

a controller for controlling the transmission power of the downlink signal to the mobile station by determining a transmission power update timing so 20 that the downlink signal received at the mobile station changes in transmission power at a predetermined timing synchronized with that of other base stations; and

when reaching the transmission power update timing,

setting the transmission power of the downlink signal to a selected one of a normally controlled level and a minimum level depending on the base station selection signal.

18. The device according to claim 17, wherein each
5 frame of the uplink signal and the downlink signal is composed of a plurality of time slots which are numbered consecutively, wherein the transmission power update timing in each of the base stations is represented by a number of same time slot.

10 19. The device according to claim 18, wherein the time slot number indicating the transmission power update timing is determined by delaying a receiving time of the base station selection signal by an amount of time determined so that the downlink signal received at the
15 mobile station changes in transmission power at same timing.

20. The device according to claim 18, wherein the time slot number indicating the transmission power update timing is determined by
20 (j + Tos) mod Fn,

where j is number of a time slot indicating a last portion

of the base station selection signal, T_{os} is waiting time for transmission power update, F_n is number of slots included in one frame, and mod is an operator whose result is the remainder of a division operation.

5 21. The device according to claim 20, wherein the waiting time T_{os} varies depending on a propagation delay between the base station and the mobile station.

10 22. The device according to claim 20, wherein the waiting time T_{os} varies depending on the time slot number
j.